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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/806,694	03/22/2004	Lester F. Ludwig	2152-3036	2364

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EXAMINER
XIAO, KE

ART UNIT	PAPER NUMBER
2629	

NOTIFICATION DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/806,694	LUDWIG, LESTER F.	
	Examiner	Art Unit	
	Ke Xiao	2629	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 November 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1 and 3-34* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1 and 3-34* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 3-25 and 27-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Armstrong (US 5,565,891) in view of Meriaz (US 2002/0113776) and Kim (US 6,424,335).

Regarding **Claim 1**, Armstrong teaches a user interface device comprising:

a hand-held housing (Armstrong, Figs. 2, 3 and 8):

a first user interface element (Armstrong, Fig. 8 entire device);

a second user interface element configured with the hand-held housing comprising a freely rotating trackball configured to be displaceable in two independent directions relative to the hand-held housing responsive to pressure applied to the trackball (Armstrong, Figs. 2 and 3 elements 102, 106, 118 and 122);

a displacement sensor generating sensor signals independently responsive to each of the two independent directions of displacement of the trackball relative to the hand-held housing (Armstrong, Figs. 2 and 3 elements 102, 106, 118 and 122) and

signal circuitry producing an outgoing displacement signal responsive to the sensor signals (Armstrong, Figs. 2 and 3 element 130).

Armstrong fails to teach a first user interface configured as claimed or a second outgoing signal. Meriaz teaches a trackball and mouse combination where the mouse device (first user interface element) is configured with the hand-held housing and generates a first plurality of signals responsive to movement of the hand-held housing relative to two orthogonal axes and circuitry for producing a second outgoing displacement signal responsive to the first plurality of signals (Meriaz, Figs. 1-2 elements 16 and 22).

It would have been obvious to one of ordinary skill in the art at the time of the invention to add the mouse functionality as taught by Meriaz to the trackball device of Armstrong in order to provide an additional level of control for the user.

Armstrong in view of Meriaz further teaches wherein the signal circuitry producing a multiplexed outgoing signal combining the signals from the first user interface element and from the displacement sensor (Armstrong, Figs. 4 and 8) and the second user interface element (Meriaz Figs. 1 and 2 mouse and trackball), whereas the multiplexed outgoing signal is capable of being de-multiplexed to provide separate parameters for controlling different functions by manipulating the first user interface element and the second user interface element (Meriaz, paragraph [0007] and Abstract the central processor takes inputs from both the mouse and the trackball and *either* the trackball or the mouse section can manipulate the cursor which means that the signals are multiplexed and de-multiplexed, the cursor functions can be different for example in the following cases: if the trackball rotates forward the cursor moves up on the display, and the mouse moves towards the user than the cursor moves down on the display).

Armstrong in view of Meriaz fails to teach wherein the first and second user interface elements *simultaneously* provide separate parameters for controlling different functions. Kim teaches *simultaneously* providing separate parameters for controlling different functions (Kim, Figs. 18-20 and 25-32, Col. 18 lines 12-52 the separate aspect can be of the same nature but a different magnitude or direction it does not have to be a different type of input all together).

It would have been obvious to one of ordinary skill in the art to expand the multiplexer of Armstrong in view of Meriaz to include the option to select *both* outputs simultaneously instead of an exclusive or multiplex in order to expand the functionality and allow for simultaneous control of the computer.

Regarding **Claim 3**, Armstrong further teaches that the trackball is displaceable in three independent directions (Armstrong, Figs. 2 and 3 xyz), wherein

the displacement sensor generates the sensor signals responsive to the three independent directions of the displacement of the trackball (Armstrong, Fig. 2 and 3 elements 102, 106, 118, 122 and 110).

Regarding **Claims 4-6**, Armstrong further teaches a rotation sensor generating a rotation sensor signal responsive to three independent components of rotation applied to the trackball (Armstrong, Fig. 7), wherein

the signal circuitry further produces an outgoing rotational signal responsive to the rotational sensor signal (Armstrong, Fig. 2 element 130).

Regarding **Claims 7-10**, Armstrong in view Meriaz of fails to teach that the displacement sensor is a variable resistive, variable capacitive, electro magnetic, or

optical element. The examiner takes official notice that all of these elements are well known in the art to be used as displacement sensors in trackball devices for sensing depression of the trackball. It would have been obvious to one of ordinary skill in the art at the time of the invention to use any of the above elements as the displacement sensor because each of them would perform the task of detecting the depression just as well and all of said elements are easily obtained and integrated into a trackball device.

Regarding **Claims 11 and 12**, Armstrong further teaches that the displacement sensor comprises a pressure sensor made of a switch (Armstrong, Fig. 2 and 3 elements 102, 106, 118, 122 and 110).

Regarding **Claim 13**, Armstrong further teaches that the outgoing displacement signal defines a click event (Armstrong, Fig. 2 elements 108 and 110).

Regarding **Claim 14**, Armstrong further teaches that the outgoing displacement signal is one parameter of a widely varying adjustable parameter (Armstrong, Figs. 1-3 X and Y displacement are widely varying parameters).

Regarding **Claim 15**, Armstrong teaches a user interface device comprising:

a hand-held housing (Armstrong, Fig. 8);

a first user interface element (Armstrong, Fig. 8);

a second user interface element configured with the hand-held housing comprising a freely rotating trackball configured to rotate relative to the hand-held housing (Armstrong, Fig. 2 and 3 elements 102, 106, 118, 122 and 110);

a rotation sensor generating a sensor signal responsive to one or more of three independent directions of rotation of the trackball (Armstrong, Fig. 7); and

signal circuitry producing an outgoing rotational signal responsive to the rotation sensor (Armstrong, Figs. 2, 7 and 8 element 130).

Armstrong fails to teach a first user interface configured as claimed or a second outgoing signal. Meriaz teaches a trackball and mouse combination where the mouse device (first user interface element) is configured with the hand-held housing and generates a first plurality of signals responsive to movement of the hand-held housing relative to two orthogonal axes and circuitry for producing a second outgoing displacement signal responsive to the first plurality of signals (Meriaz, Figs. 1-2 elements 16 and 22).

It would have been obvious to one of ordinary skill in the art at the time of the invention to add the mouse functionality as taught by Meriaz to the trackball device of Armstrong in order to provide an additional level of control for the user.

Armstrong in view of Meriaz further teaches wherein the signal circuitry producing a multiplexed outgoing signal combining the signals from the first user interface element and from the rotation sensor (Armstrong, Figs. 3 and 7) and the second user interface element (Meriaz, Figs. 1 and 2 trackball and mouse control) (Meriaz, paragraph [0007] and Abstract *either* the track ball or the mouse is operated which means that the signals are multiplexed and de-multiplexed).

Armstrong in view of Meriaz fails to teach wherein the first and second user interface elements *simultaneously* provide separate parameters for controlling different functions. Kim teaches *simultaneously* providing separate parameters for controlling different functions (Kim, Figs. 18-20 and 25-32, Col. 18 lines 12-52 the separate aspect

can be of the same nature but a different magnitude or direction it does not have to be a different type of input all together).

It would have been obvious to one of ordinary skill in the art to expand the multiplexer of Armstrong in view of Meriaz to include the option to select *both* outputs simultaneously instead of an exclusive or multiplex in order to expand the functionality and allow for simultaneous control of the computer.

Regarding **Claim 16**, Armstrong further teaches that the three independent directions of rotation of the trackball respectively comprise roll, pitch and yaw of the trackball (Armstrong, Fig. 7).

Regarding **Claim 17**, Armstrong further teaches that the signal circuitry comprises a signal processor (Armstrong, Fig. 2 element 130).

Regarding **Claim 18**, Armstrong further teaches a first of the three rotation component signals is generating in response to rotational roll of the trackball, a second of the three rotation component signals is generating in response to rotational pitch of the trackball, a third of the three rotation component signals is generating in response to rotational yaw of the trackball (Armstrong, Fig. 1 elements 124, 126 and 128).

Regarding **Claims 19-25** Armstrong in view of Meriaz fails to teach that the rotation sensor is a capacitive, optical, polarized optical, magnetic, electro magnetic, or acoustic sensor. The examiner takes official notice that all of these sensors are well known in the art to be used as rotation sensors in trackball devices for sensing rotation of the trackball. It would have been obvious to one of ordinary skill in the art at the time of the invention to use any of the above sensors as the rotation sensors because each

of them would perform the task of detecting the rotation just as well, and all of said sensors are easily obtained and integrated into a trackball device. Additionally acoustic sensors detect resonance and magnetic sensors detect polarization component.

Regarding **Claim 27**, Armstrong further teaches that the hand-held housing has a saddle assembly configured to be displaceable within the housing responsive to pressure applied to the trackball (Armstrong, Fig. 2 element 16 and 20);

a displacement sensor generating a displacement sensor signal responsive to the displacement of the saddle assembly relative to the housing (Armstrong, Fig. 2 elements 16, 20, 108 and 110); and

the sensor signal circuitry further producing an outgoing displacement signal responsive to the displacement sensor signal (Armstrong, Fig. 2 element 130).

Regarding **Claims 28 and 29**, Armstrong further teaches that the displacement sensor comprises a pressure sensor that is a switch configured to generate a displacement sensor signal as a non-binary signal (Armstrong, Fig. 2 elements 108 and 110, Col. 3 lines 25-31 the sensor can be a number of different types of switches such as resistive, capacitive, piezoelectric all of which generate analog signals which are considered non-binary).

Regarding **Claim 30**, Armstrong further teaches that the outgoing displacement signal defines a click event (Armstrong, Fig. 2 elements 108 and 110).

Regarding **Claim 31**, Armstrong further teaches that the outgoing displacement signal is one parameter of a widely varying adjustable parameter (Armstrong, Fig. 1 X and Y displacement are widely varying parameters).

Regarding **Claims 32 and 33**, Armstrong further teaches that the saddle assembly is displaceable in three independent directions (Armstrong, Figs. 2 and 4 X, Y and Z directions), wherein

the displacement sensor generates the sensor signal responsive to the three independent directions of the displacement of the saddle assembly (Figs. 2, 5 and 6 elements 108 and 110).

Regarding **Claim 34**, Armstrong in view of Meriaz further teaches wherein the signal circuitry comprises a multiplexer (Meriaz, paragraph [0007]).

Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Armstrong (5,565,891) in view of Meriaz (US 2002/0113776) and Kim (US 6,424,335) as applied to claims 1, 3-25 and 27-34 in further view of Yokoji (US 6,909,422).

Regarding **Claim 26**, Armstrong in view of Meriaz and Kim fails to teach that one direction of the three independent directions of rotation defines a click event. Yokoji teaches that a click event can be associated with any direction of rotation of a trackball (Yokoji, Figs. 2 and 7, Col. 2 lines 1-35). It would have been obvious to one of ordinary skill in the art at the time of the invention to add the click event as taught by Yokoji to the rotational directions of Armstrong in order to provide a rotational haptic feedback to the user.

Response to Arguments

Applicant's arguments filed November 19th 2009 have been fully considered but they are not persuasive.

Regarding **Claims 1, 15 and 34**,

The applicant claims that the combination of Armstrong in view of Meriaz is improper because Armstrong teaches away from the use of a conventional mouse. Specifically that the combination of Meriaz with Armstrong would destroy the device of Armstrong. The examiner respectfully disagrees. The examiner would like to point out again that Fig. 8 of Armstrong clearly shows a trackball embodiment of the invention that includes the cradle. The bottom of the trackball merely rests upon the table when in use, and the conventional trackball portion of the invention is given further functionality through the teachings of Armstrong. Meriaz teaches a trackball mouse combination. The base the trackball system of Armstrong is exactly the same as that of a conventional trackball however Meriaz teaches that said base can be modified to include a secondary cursor control mechanism in the form of a mouse ball or a optical sensor. Just because the system of Meriaz modifies a particular section of Armstrong does not mean that it destroys the intended function of Armstrong. Armstrong as modified by Meriaz would be able to perform all the function of Armstrong because the modification of the secondary input has no affect on how well the trackball functions perform. The combination is therefore maintained.

The applicant further argues that Meriaz fails to teach multiplexing and a multiplex circuit as claimed. The examiner respectfully disagrees. The examiner

believes that the applicant trying to use "multiplex" in a narrow definition. However the examiner would like to point out that one of ordinary skill in the art would understand that "multiplex" in the context of signal transmission is merely a signal selection process. Meaning, from a set of input signals, output a subset of those input signals based on a control signal. Meriaz clearly teaches such a feature since *either* the mouse *or* the trackball is used to control the cursor movement, which means there must inherently be a selection circuitry for choosing which of the two inputs affects the cursor movement, thus satisfying the claimed limitation of multiplex.

Also in light of the newly added limitations, the applicant's remaining arguments with respect to claims 1 and 3-34 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ke Xiao whose telephone number is (571)272-7776. The examiner can normally be reached on Monday through Friday from 8:30AM to 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sumati Lefkowitz can be reached on (571) 272-3638. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Ke Xiao/
Examiner, Art Unit 2629